SEMESTER END EXAMINATION APRIL-MAY, 2026

Course Name: - B.Tech **Semester:- 2nd**

Paper Name: - Engineering Chemistry **Paper Code:- NBS 203**

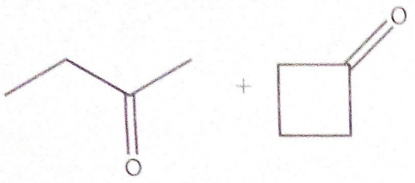
Time - 3 Hrs + 20 minutes per hour extra time for V.I. & examinees with writer. **Max Marks-70**

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries **3 mark. All questions are compulsory.**
- Section B- Answer any **5 out of 7** given questions. Each question carries **7 marks.**
- Section C- Answer any **2 out of 3** given questions. Each question carries **10 marks.**

Section - A
Multiple Choice Questions

1. Answer all the following questions. **5x3 =15**



i)

(a) 3-(1-hydroxycyclobutyl)butan-2-one

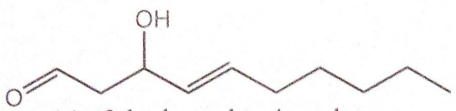
(b)1-hydroxy-1-(1-methylcyclobutyl)propan-2-one

(c) 3-(2-hydroxycyclobutyl)butan-1-one

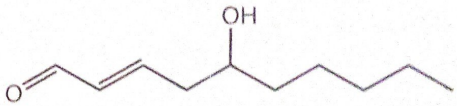
(d)3-hydroxy-1-(1-methylcyclobutyl)butan-2-one

ii)

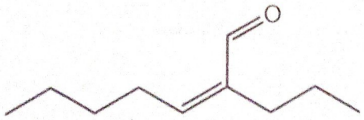
dil alkali NaOH and Heat ⟶ product will be



(a) 3-hydroxydec-4-enal



(c) 5-hydroxydec-2-enal



(b) 2-propylhept-2-enal

(d) Decanal

iii) Which of the following species has the highest bond order?

a. O_2
b. O_2^+
c. O_2^-
d. O_2^{2-}

iv) Calculate the degree of hardness of water sample containing $MgCl_2$ and $CaSO_4$ each of 150 mg/L.

(a) 268.2 ppm (b) 265.2ppm (c) 258.2 ppm (d) 298.2ppm

V. How much electricity is required to extract 100 g of Aluminium from its Sulphate solution in terms of Faraday and Coulomb?

(Given: Atomic mass of Al = 27 g/mol,)

(a). 5.56 F and 5.36×10^5 C

(b). 11.11 F and 1.07×10^6 C

(c). 3.70 F and 3.57×10^5 C

(d). 2.78 F and 2.68×10^5 C

Section – B
Short Answer Questions

2. Answer any five of the following questions. **5x7=35**

i. Write a brief notes on 12 principles of green chemistry.

ii. Explain the construction and working of a galvanic cell with structures and chemical equations.

iii. Differentiate between thick and thin film lubrication mechanism with a fair diagram.

iv. Discuss the manufacturing and % composition of cement with figure and chemical equations of rotary kiln.

v. Calculate bond order and draw MO diagram of O_2, F_2 and N_2 molecules.

vi. Explain the mechanism of Reimer tiemann reaction with statement, mechanism and example.

vii. Find the value of E-cell and gibes energy change for given redox couple of a galvanic cell
Mg(s)|Mg2+(0.001M)||Cu2+(0.0001 M)|Cu(s)
Given E^0 cell (Mg2+/Mg = –0.76 V, Cu2+/Cu = 0.34 V)

Section – C
Descriptive Questions

3. Answer any two of the following question. **2x10=20**

i) Explain the term liquid crystal in detail with all its types and structures. List some of its applications and examples.

ii) What are semiconductors ? How n-type and p-type semiconductors are formed ? Give example. Also enlighten the formation, structure and working of P-N junction.

iii) Is corrosion an electrochemical change? Explain with principle, equations and its types. How different factors affect its rate.

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